

Work Order ID 84557

84557

Page 1

May-16-12 10:38:28 AM

Item ID: D212-664-201

Accept

N900040100

Setup Start *NS1*

Revision ID:

Stop *NS2*

Item Name: Crosstube Aft

Start Date: 5/16/12 Start Qty: 1.00 *1*

Required Date: 5/16/12 Req'd Qty: 1.00 *1*

Reference: rework- ECN11-614

Cust Item ID:

Customer:

Approvals: Process Plan: W Date: Tooling: Date:

QC: Date: SPC (Y/N): Date:

DART Dart Aerospace Ltd. 1270 ABERDEEN ST HAWKESBURY, ON, CANADA K6A 1K7		TC APPROVAL # 09-89 TEL: 1-613-632-5200	
P/N	D212-664-201	CHG	CHG003
DESC.	Crosstube Aft High	STC	SH01-9
LOT	B39659	STC	SR01298NY
MODEL	Beil 204/205/210/212/214	STC	
MADE IN CANADA D2726-1			

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

Draw Nbr	Revision Nbr
D212-664-241	Rev D (DEO)
DSI9563	B

100

100

DC

Document Control

DOCUMENT CONTROL

Memo

Photocopy bluefile and create labels as per PPP D212-664-201

0.00

CHG005

B39659 CHG003

Work Order ID 84557***84557***

Page 2

May-16-12 10:38:28 AM

Item ID: D212-664-201

Accept

N900040100Setup Start ***NS1***

Revision ID:

Stop ***NS2***

Item Name: Crosstube Aft

Start Date: 5/16/12 Start Qty: 1.00 ***1***

Cust Item ID:

Required Date: 5/16/12 Req'd Qty: 1.00 ***1***

Customer:

Reference: rework- ECN11-614

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start ***NR1***

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
--------------------------------	--------------------------	----------------------	---------	--------	--------------	---------------	---------------	------------------	----------------

210

Spray Painting per QSI005 4.2

0.00

210

SprayPaint

0.00

SprayPaint

Memo

REWORK FINISH OF CROSSTUBE TO CHG004 PER ECN11-549
PER DEO D212-664-241-D-1
TO INCORPORATED VIEWING WINDOW
STRIP CROSSTUBE IF APPLICABLE
RE-PRIME AND PAINT WITH VIEWING WINDOW.
1-Prime inside and outside crosstube as per QSI 005 4.2

2-Paint outside crosstube as per DEO D212-667-241 with White Imron as per
QSI 005 4.2

PRIME:

Start Time: _____

Finish Time: _____

PAINT:

Start Time: _____

Finish Time: _____

220

QC14- Inspect Spray Paint

0.00

220

QC

Memo

0.00

Quality Control

Then, Wrap in plastic bag to protect from scratches

84557

May-16-12 10:38:28 AM

N900040100

Setup Start *NS1*

Stop *NS2*

Cust Item ID:

Start Date: 5/16/12 **Start Qty:** 1.00 ***1***

Customer:

Required Date: 5/16/12 Req'd Qty: 1.00 * 1 *

Reference: rework- ECN11-614

Approvals: **Process Plan:** _____ **Date:** _____ **Tooling:** _____ **Date:** _____

Run Start *NR1*

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop *NR2*

[illegible]

0.00

230

Crosstubes

0.00

Crosstubes

Memo

Crosstubes

UPDATE TO CHG005 PER ECN11-614

REMOVE SUPPORTS AND UPDATE PER DSI9563

1-Abraide mating surfaces of support and crosstube with 400 grit sandpaper, clean the area with 4105S wash 'n' wipe

2-Install supports with Proseal 890 per DSI9563 and QSI 015

A/R Proscal 890 Batch:

3-Install clamps as per Dwg D212-664-241. Torque clamps to 80-100 in lb.

QC5- Inspect part completeness to step on W/O

0.00

240

Memo

0.00

OC

Quality Control

Work Order ID 84557

May-16-12 10:38:28 AM

84557

Page 4

Item ID: D212-664-201

Accept

N900040100Setup Start ***NS1***

Revision ID:

Stop ***NS2***

Item Name: Crosstube Aft

Start Date: 5/16/12 Start Qty: 1.00 ***1***

Cust Item ID:

Required Date: 5/16/12 Req'd Qty: 1.00 ***1***

Customer:

Reference: rework- ECN11-614

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start ***NR1***

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop ***NR2***

Sequence ID/ Work Center ID	Operation Description	Set Up/ Run Hours	Tool ID	Tool #	Plan Code	Accept Qty	Reject Qty	Reject Number	Insp. Stamp
250	Pick Kit	0.00							
250									
Packaging	Memo	0.00							
Packaging	ENSURE ORIGINAL KIT IS IN BOX								
260	QC4- 100% Inspect kits for completeness	0.00							
260									
QC	Memo	0.00							
Quality Control									
270		0.00							
270									
Packaging	Packaging								
Packaging	Memo	0.00							
Packaging	REPACKAGE PER PPP USING NEW B/N NEW LABELS AND PAPERWORK REQ'D								
	Identify and pack for shipping as per PPP D212-664-201								

Work Order ID 84557

84557

Page 5

May-16-12 10:38:28 AM

Item ID: D212-664-201

Accept

N900040100

Setup Start *NS1*

Revision ID:

Stop *NS2*

Item Name: Crosstube Aft

Start Date: 5/16/12 Start Qty: 1.00 *1*

Cust Item ID:

Required Date: 5/16/12 Req'd Qty: 1.00 *1*

Customer:

Reference: rework- ECN11-614

Approvals: Process Plan: _____ Date: _____ Tooling: _____ Date: _____

Run Start *NR1*

QC: _____ Date: _____ SPC (Y/N): _____ Date: _____

Stop *NR2*

Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Tool ID Tool # Plan
Code Accept Reject Reject Insp.
Qty Qty Number Stamp

280

QC21- Final Inspection - Work Order Release

0.00

280

QC

Memo

0.00

Quality Control

112203

Picklist Print

May-16-12 10:38:28 AM

Page 1

Work Order ID: 84557

Parent Item: D212-664-201

Parent Item Name: Crosstube Aft

Start Date: 5/16/12

Required Date: 5/16/12

Start Qty: 1.00

Required Qty: 1.00

Comments: IPP Rev:E04.02.16ReformatK/DS
IPP Rev:F 06-03-29 Remove Coments on Pick List JLM
IPP Rev:G 07-04-30 As per Rev C JLM
IPP Rev:H 08-05-22 up date Qty of rubber cushion DD verified by:EC

Component Item ID/ Item Name	Replacement Item ID	Mfg/ Purch	Bin Item	Primary Location	Last Location	Route Seq ID	Unit of Measure	Qty on Hand	Qty per Kit	Total Qty	Qty Issued	Date Issued	Status
D212-664-201 Crosstube Aft		Manufactured	No				Each	0.0000		1			

DART SERVICE INSTRUCTION

TO AMEND INSTRUCTIONS FOR CONTINUOUS AIRWORTHINESS ICA-D212-664 Rev. 6 OR LATER

REF. CANADIAN STC: SH01-9

REF. FAA STC: SR01298NY

REF. EASA STC: EASA.IM.R.S.01304

PURPOSE:

The supports on the following crosstubes are now installed using Proseal instead of Magnobond:

D212-664-101/-101B @ CHG 005

D212-664-201/-201B @ CHG 005

D412-664-105 @ CHG 002

D212-664-207/-207B @ CHG 002

D212-664-107/-107B @ CHG 002

CHANGE:

For the crosstubes listed above, section 32.4 of ICA-D212-664 is amended as follows. Use Figure 1 of this service instruction and Figures 32-2 to 32-9 of ICA-D212-664 for further reference. For crosstubes of an earlier change number, it is recommended that if the supports are removed, the supports should be reinstalled using the procedure listed below.

32.4 SUPPORT INSTALLATION

32.4.1 Locate the area on the crosstube for installation of support (see Figure 1 of this service instruction). For D212-664-101/-107/-201/-207 and D412-664-105 crosstubes, the outward face of the support tabs should be 14.0" (355mm) from the crosstube center for 204/205/210/412/UH-1 aircraft. For installation on 214B/B-1 aircraft, the outward face of the support tabs should be 13.75" (349mm). Ensure paint finish of crosstube is intact; touch up as required per Chapter 5 (5.3.9) of ICA-D212-664.

32.4.2 If present, remove any paint/primer on bottom of supports. Abrade mating surfaces of support and crosstube with 400-grit sandpaper. Saturate a clean cloth with MEK or 4105S Wash'n'Wipe Degreaser or equivalent and wipe until there is no residue.

32.4.3 Ensure a layer of 3M Scotch-Weld 2216 B/A Epoxy Adhesive is on the bottom of the support. If required, either apply or touch-up support to have a 0.03" to 0.05" thick layer of adhesive over the entire mating surface. Allow supports to cure for 24 hours.

32.4.4 Abrade mating surfaces of support (after cure) and crosstube with 180-grit sandpaper. Saturate a clean cloth with MEK or 4105S Wash'n'Wipe Degreaser or equivalent and wipe until there is no residue.

32.4.5 Apply a 0.04" to 0.07" thick layer of Proseal 890 Class B or AMS-S-8802 Class B sealant underneath applicable support and install support as shown in Figure 1 of this service instruction.

32.4.6 Install the clamps opposite to crosstube support as shown in section A-A of Figure 1. Install rubber cushions underneath each clamp around the bottom circumference of the crosstube up to the crosstube centerline. Torque clamps 80-100 in-lb (9.0-11.3 Nm). It is acceptable to use smaller or larger sized MS21920-XX clamps than those listed in ICA-D212-664, ensure that after torquing the clamps per this instruction, the nuts are in safety but not bottomed out

32.4.7 Prior to installing crosstube on aircraft, allow supports to cure for 72 hours and recheck torque on clamps.

CANADA
DEPARTMENT OF TRANSPORT
AIRCRAFT CERTIFICATION
BRANCH
DAO # 01-O-01

APPROVED
BY: *[Signature]*
D. SHEPHERD (DE # 02)

DATE: 11.07.20
CERT. NO.: SH01-9
ISSUE NO.: 3

B	ADD 3M 2216 ADHESIVE TO SUPPORT	CP	11.07.15
A	NEW ISSUE	CP	11.06.14
REV.	DESCRIPTION	BY	DATE
DESIGN	<i>Q</i>	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN	<i>Q</i>		
CHECKED	<i>ASS</i>	DRAWING NO.	REV. B
MFG. APPR.	<i>N/A</i>	DSI 9563	SHEET 1 OF 2
APPROVED	<i>[Signature]</i>	TITLE	SCALE
DE APPR.	<i>[Signature]</i>	SUPPORT INSTALLATION CHANGE	NTS
DATE	11.07.15	COPYRIGHT © 2011 BY DART AEROSPACE LTD THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE LTD.	

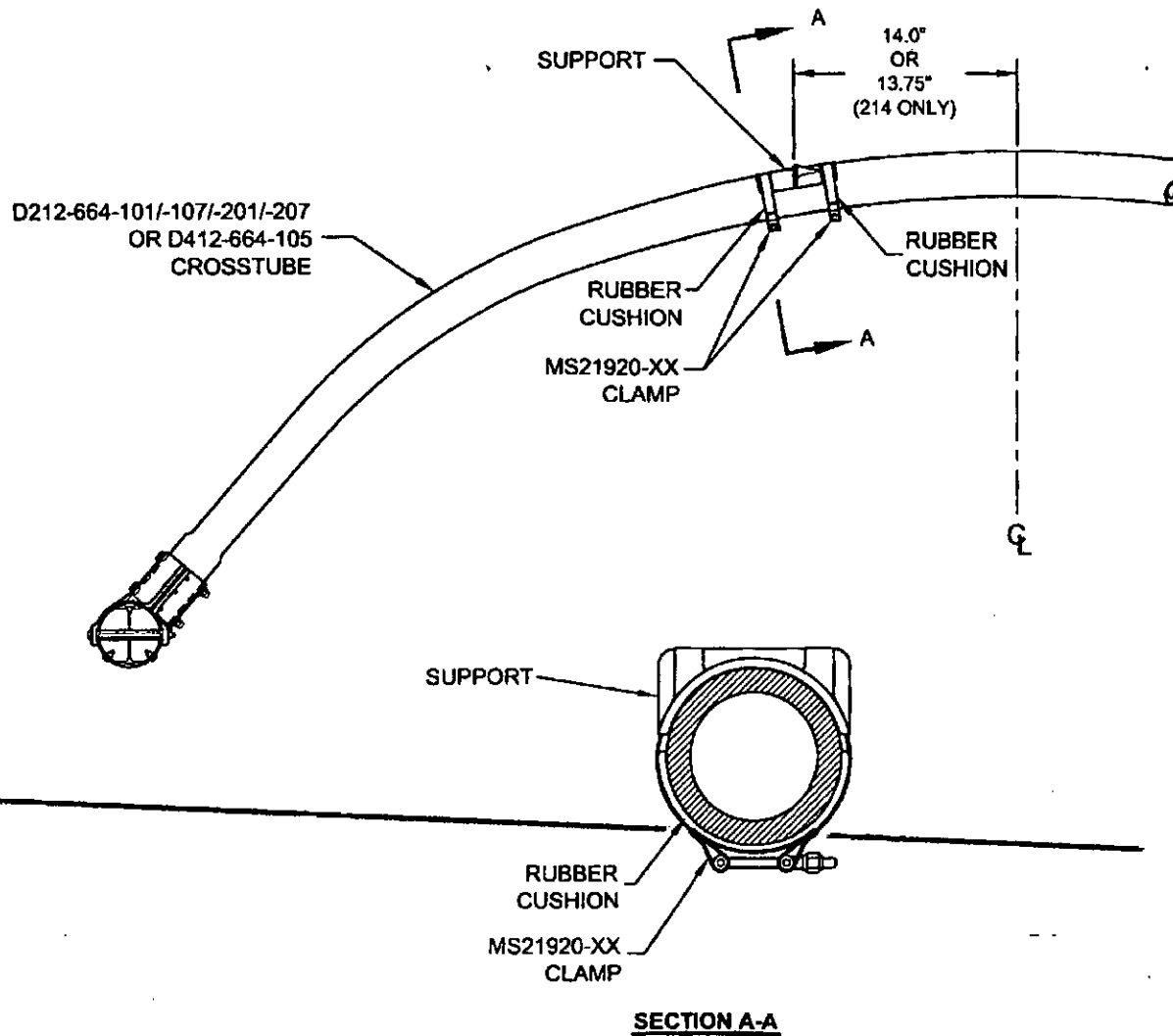


FIGURE 1: SUPPORT INSTALLATION

CANADA
DEPARTMENT OF TRANSPORT
AIRCRAFT CERTIFICATION
BRANCH
DAO # 01-O-01

APPROVED
BY: *[Signature]*
D. SHEPHERD (DE # 02)

DATE: 11.07.20
CERT. NO.: SH01-9
ISSUE NO.: 3

DESIGN	Q	DART AEROSPACE LTD	
DRAWN	Q	HAWKESBURY, ONTARIO, CANADA	
CHECKED	ASS	DRAWING NO.	REV. B
MFG. APPR.	N/A	DSI 9563	SHEET 2 OF 2
APPROVED	JND	TITLE	SCALE
DE APPR.	TH	SUPPORT INSTALLATION CHANGE	NTS
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Item	Qty -241	Qty -241B	Part Number	Description
1	X		D212-664-241	CROSSTUBE ASSEMBLY (205/212 HIGH AFT)
2		X	D212-664-241B	CROSSTUBE ASSEMBLY (214 HIGH AFT)
3	1	1	D6006-129	CROSSTUBE
4	2	2	D2940-1	SUPPORT
5	4	4	D3595-063-530	RUBBER CUSHION
6	4	4	MS21920-28	CLAMP (OR MS21920-30)
7	A/R	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 299-947-100, TYPE II, CLASS 2 ADHESIVE)

GENERAL NOTES:

- MATERIAL: MANUFACTURED FROM D6006-129
FINISHED LENGTH = 124.362±0.020
- FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2
- TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED.
- UNITS: INCHES UNLESS OTHERWISE NOTED.
- BREAK SHARP EDGES: 0.005 TO 0.010 MAX.
- IDENTIFICATION: SCRIBE DART PART NUMBER "D212-664-XXX" AND BATCH NUMBER ON INSIDE OF CUFF USING VIBRATING STYLUS.
- WEIGHT: D212-664-241 = 44.2 lbs (PER IIN-D212-664)
D212-664-241B = 44.2 lbs (PER IIN-D212-664)
- PART IS SYMMETRIC ABOUT CENTERLINE.
- RUN CUTTER OFF PART. BLEND OUT EDGE LONGITUDINALLY, TRANSITION SHOULD BE SMOOTH.
- BEND PROGRESSIVELY WITH A MINIMUM OF 5 PASSES. MAXIMUM TUBE FLATTENING DUE TO BENDING IS 6% BASED ON O.D.
- LIQUID PENETRANT INSPECT OUTSIDE SURFACE OF CROSSTUBE PER QSI 038.
- INSTALL D2940-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF D2940-1 THAT WILL BE IN CONTACT WITH THE CROSSTUBE PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- INSTALL MS21920-28 CLAMPS (OR -30) WITH D3595-063-530 RUBBER CUSHIONS TO SECURE THE D2940-1 SUPPORT ON TOP SIDE OF THE CROSSTUBE. ENSURE CLAMPS ARE OPPOSITE OF CROSSTUBE SUPPORT.
- EXTREME CARE MUST BE TAKEN TO PROTECT THE OUTSIDE SURFACE OF THE TUBE. THE OUTSIDE SURFACE MUST BE SMOOTH AND FREE FROM SURFACE DEFECTS SUCH AS SCRATCHES, NICKS, OR DENTS. DEFECTS UP TO 0.005" MAY BE BLENDED OUT LONGITUDINALLY. CIRCUMFERENTIAL GRIND MARKS ARE UNACCEPTABLE.
- TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

600 11-614
11.08.25

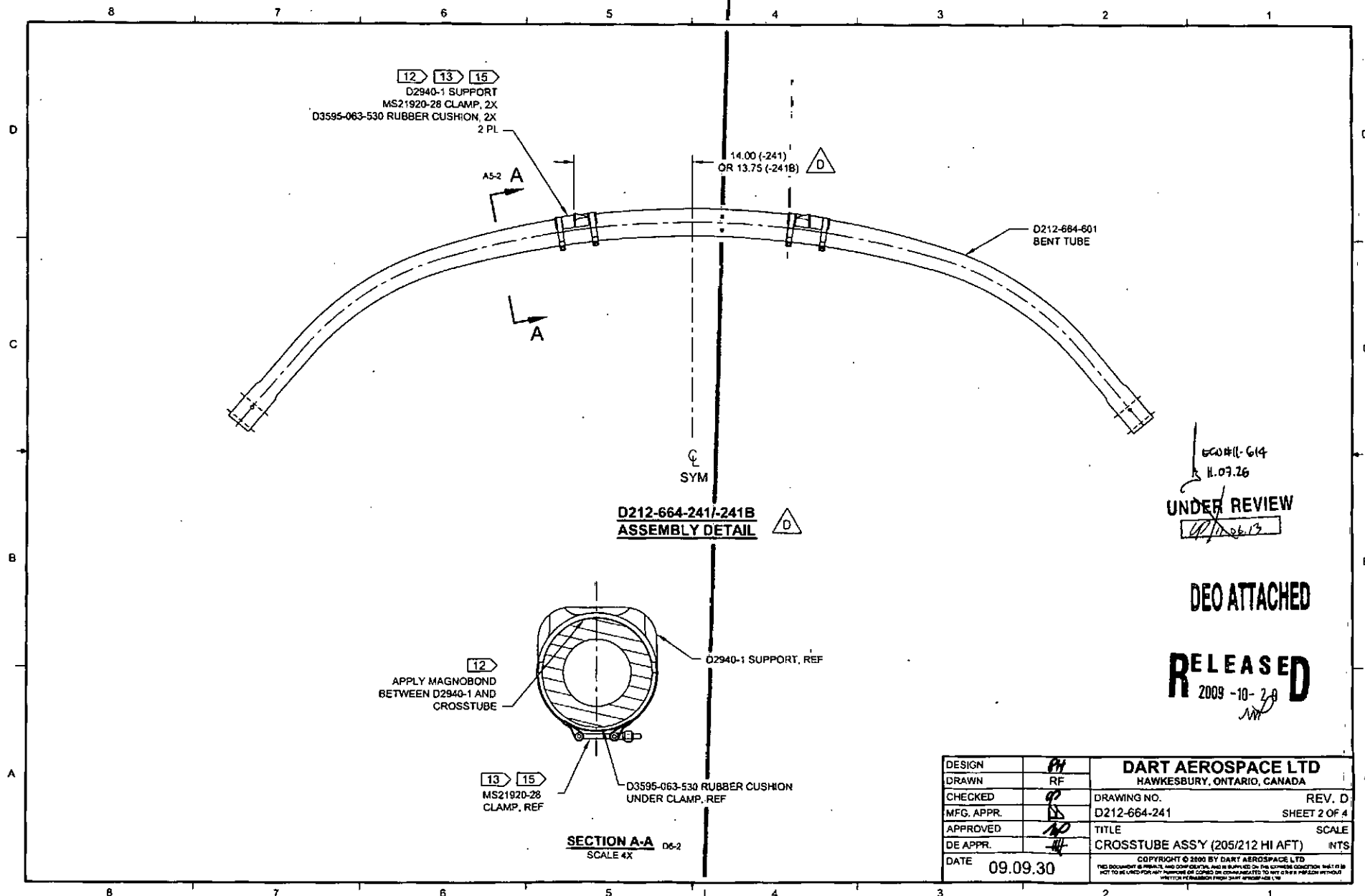
UNDER REVIEW

DEO ATTACHED

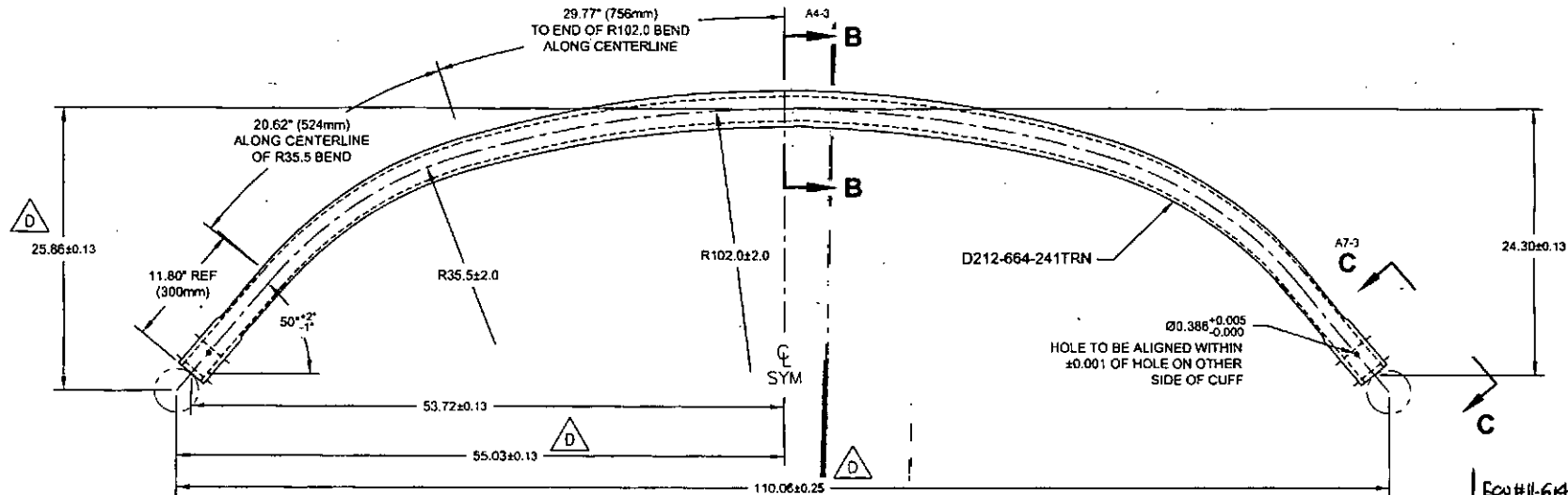
RELEASED
2009 -10-29

D	REFORMAT/REVISE GENERAL NOTES/PART LIST; REORGANIZED VIEWS AND REFORMATTED DRAWING TO CURRENT STANDARDS; ADD -241B (ZN D4-2, B4-2); REMOVED REF & ADD TOLERANCES (ZN D8-3 & C4-3, C6-3 & A8-3); RELOCATED FLAG #6 PER PAR 08-046 (ZN A5-3); MOVED TURNING DETAIL & UPDATED TOLERANCE TO SHEET 4	RF	09.09.30
C	REMOVE -1009 ABRASION STRIP; ADD MAGNOBOND 6398, CUSHION, REVERSE CLAMPS	PH	07.03.08
B	ADD HOLES FOR COMPATABILITY WITH BHT/AA SKIDTUBES	PH	05.02.04
A	NEW ISSUE	PH	00.12.12
REV.	DESCRIPTION	BY	DATE
DESIGN	RF	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
DRAWN	RF	REV. D	
CHECKED	RF	DRAWING NO. D212-664-241 SHEET 1 OF 4	
MFG. APPR.	RF	TITLE SCALE	
APPROVED	RF	CROSSTUBE ASSY (205/212 HI AFT) NTS	
DE APPR.	RF	DATE 09.09.30	

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8 7 6 5 4 3 2 1



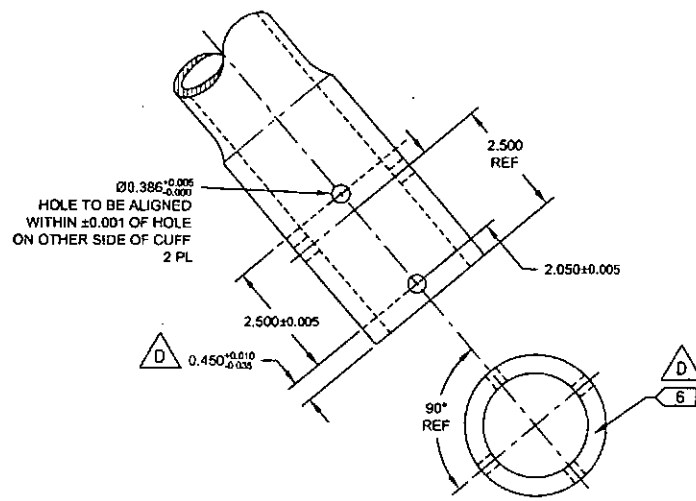
D212-664-601
BENDING AND DRILLING DETAIL

ECO HIL-614
K07.26

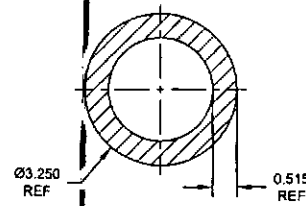
UNDER REVIEW
09/11/08/13

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RELEASED
2009-10-28



VIEW C-C: CUFF DETAIL
SCALE 3X



SECTION B-B
SCALE 4X

DESIGN	PH	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	JP	DRAWING NO.	REV. D
MFG. APPR.	BS	D212-664-241	SHEET 3 OF 4
APPROVED	JP	TITLE	SCALE
DE APPR.	JP	CROSSTUBE ASS'Y (205/212 HI AFT)	NTS
DATE	09.09.30	COPYRIGHT © 2006 BY DART AEROSPACE LTD	

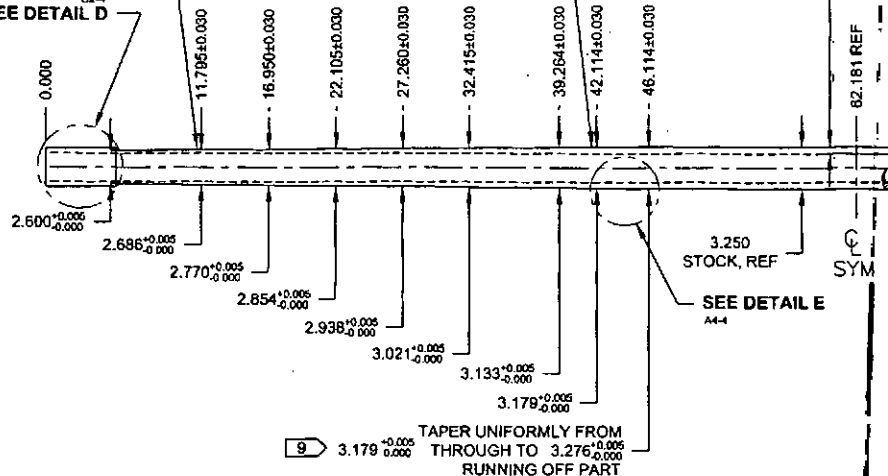
8 7 6 5 4 3 2 1

R100.0 TRANSITION
BETWEEN TAPERED
SECTIONS

R100.0 TRANSITION
BETWEEN TAPERED
SECTIONS

0.515 WALL
STOCK, REF

SEE DETAIL D



30° X 0.500 DEEP
CHAMFER

R0.063

SEE DETAIL F

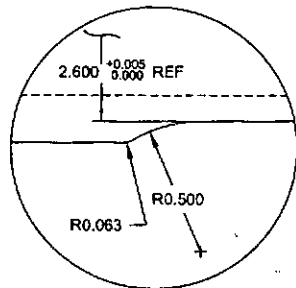
DETAIL D:
CROSSTUBE CUFF DB-4
SCALE 5X

000AH-614
11.07.26
UNDER REVIEW
9/1/08/13

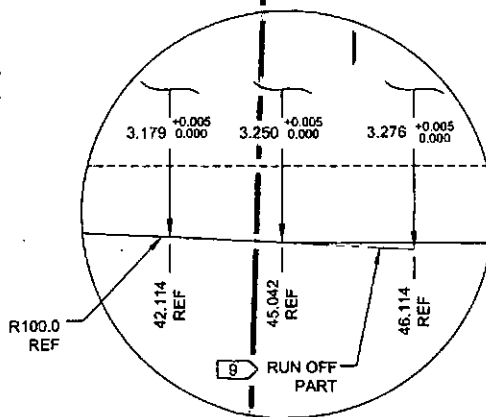
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2009-10-29
MMP

D212-664-241TRN
TURNING DETAIL



DETAIL F:
CUFF TRANSITION C2-4
SCALE 10X



DETAIL E:
TAPER RUN-OFF C5-4
NOT TO SCALE

DESIGN	PH	DART AEROSPACE LTD	
DRAWN	RF	HAWKESBURY, ONTARIO, CANADA	
CHECKED	JP	DRAWING NO.	REV. 0
MFG. APPR.	JS	D212-664-241	SHEET 4 OF 4
APPROVED	AP	TITLE	SCALE
DE APPR.	TH	CROSSTUBE ASSY (205/212 HI AFT)	NTS
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DRAWING NO. D212-664-241	TITLE CROSSTUBE ASSY (205/212 HI AFT)	REV. D	DART AEROSPACE LTD. ENGINEERING ORDER		D.E.O. NO. D212-664-241-D-1	SHEET NO. SHEET 1 OF 2	SCALE NTS
DRAWN	CHECKED	MFG. APPR.	APPROVED	DE APPR.			
DATE 11.04.07	DATE 11.04.11	DATE 11.04.12	DATE 11/04/12	DATE 11.04.12			

PURPOSE:

ADD AN INSPECTION WINDOW TO UNDERSIDE OF CROSSTUBE.

CHANGE:

NOTES 2 OF SHEET 118 AMENDED AS FOLLOWS:

IS:

- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
MASK UNDERSIDE OF CROSSTUBE AS SHOWN (HATCHED AREA) AND
PAINT OUTSIDE PER DART QSI 005 4.2
REMOVE MASKING AND APPLY CLEAR COAT

WAS:

- 2) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
PRIME INSIDE AND OUTSIDE PER DART QSI 005 4.2
PAINT OUTSIDE PER DART QSI 005 4.2

RELEASED
2011-04-18

UNDER REVIEW

11.16.13

RCW#11-614

11.07.20

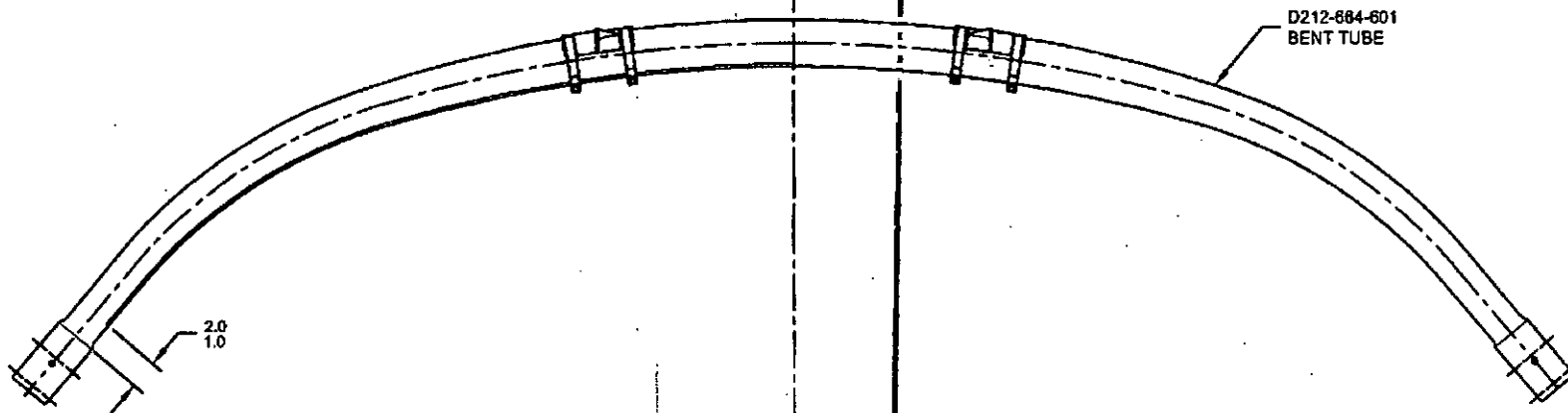
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DRAWING NO. D212-664-241	TITLE CROSSTUBE ASSY (205/212 HI AFT)	REV. D	DART AEROSPACE LTD ENGINEERING ORDER	D.E.O. NO. D212-664-241-D-1	SHEET NO. SHEET 2 OF 2	SCALE NTS
DRAWN	CHECKED <i>UP</i>	MFG. APPR. <i>E</i>	APPROVED <i>MD</i>	DE APPR. <i>MD</i>		
DATE 11.04.07	DATE 11.04.11	DATE 11.04.12	DATE 11/04/12	DATE 11.04.12		

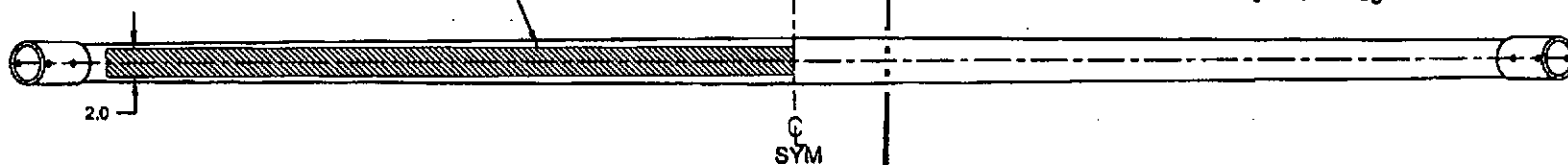
IS:

WAS:



**D212-664-241/-241B
ASSEMBLY DETAIL**

MASK AREA PRIOR TO PAINTING,
REMOVE MASKING AFTER PAINT
AND APPLY CLEAR COAT



RELEASED
2011-04-18

UNDER REVIEW

UP 11.06.13
11.07.28

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DRAWING NO. D212-664-241	TITLE CROSSTUBE ASS'Y (205/212 HI AFT)	REV. D	DART AEROSPACE LTD ENGINEERING ORDER		D.E.O. NO. D212-664-241-D-2	SHEET NO. SHEET 1 OF 1	SCALE NTS
DRAWN 47	CHECKED ASS	MFG. APPR. 8	APPROVED MP		DE APPR. H		
DATE 11.07.15	DATE 11.07.20	DATE 11.07.21	DATE 11.07.21		DATE 11.07.21		

PURPOSE:

REPLACE MAGNOBOND WITH PROSEAL.

CHANGE:

IS:

Item	Qty -241	Qty -241B	Part Number	Description	
7	A/R	A/R	PROSEAL 890 B-2	SEALANT, AMS-S-8802 CLASS B-2	1

WAS:

7	A/R	A/R	MAGNOBOND 6398	ROCKWELL SPECIFICATION RBO-120-023 ADHESIVE (TEXTRON/BELL SPEC. 289-947-100, TYPE II, CLASS 2 ADHESIVE)	
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NOTE 12 & 15, SHEET 1 IS AMENDED AS FOLLOWS:

IS:

- 12) TO INSTALL D2940-1 SUPPORT: ABRASE MATING SURFACE OF SUPPORT AND CROSSTUBE WITH 180-GRIT SANDPAPER AND REMOVE RESIDUE WITH MEK (OR EQUIVALENT). APPLY A 0.04" TO 0.07" THICK LAYER OF PROSEAL 890 CLASS B-2 (OR AMS-S-8802 CLASS B-2) SEALANT TO MATING SURFACE OF SUPPORT.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING. **PRIOR TO PACKAGING, RE-CHECK TORQUE ON CLAMPS AFTER PROSEAL 890 SEALANT HAS CURED FOR 72 HOURS.**

WAS:

- 12) INSTALL D2940-1 SUPPORT USING 0.03" TO 0.06" THICK LAYER OF MAGNOBOND 6398 TO THE SURFACE OF D2940-1 THAT WILL BE IN CONTACT WITH THE CROSSTUBE PER QSI 015. LET CURE FOR 12 HOURS AFTER INSTALLATION AND PRIOR TO PACKAGING.
- 15) TORQUE CLAMPS 80 TO 100 IN-LB. ENSURE AT LEAST 1.5 THREADS SHOWING IN SAFETY AND THAT NUT HAS NOT BOTTOMED-OUT AFTER TORQUING.

RELEASED
2011-07-28
WJ

ENGINEERING CHANGE NOTICE **DART AEROSPACE LTD**

Date: 11.07.22	Job No.: RD2352	ADR Yes/No: N	ADR Date: N/A	ECN #: 11- 614
Product No.: D212-664		Created By: CP	Approved By: <i>[Signature]</i>	
Product Name: Crossube		Checked By: <i>[Signature]</i>	General Manager Approval:	

Distribution	Reqd	Resp	Initial / Date
Production Manager / Coord.	Y	LL	<i>LL 11.07.22</i>
Purchasing Coord.	Y	CL	<i>CL 11.07.22</i>
Production Engineering Coord.	Y	EC/DO	<i>EC 11.07.22</i>

Distribution	Reqd	Resp	Initial / Date
DQA / QA Coord.	N		
QC Coordinator	Y	ED	<i>ED 11.07.22</i>
Customer Technical Support	Y	SW/CK	<i>SW 11.08.16</i>
Marketing	Y	MB	<i>MB 11.07.22</i>
Customer Order Processing	N		

Reason for Change:
Update support installation to address slipping complaints

Documents Affected:
Release:
- DEO D212-664-141-D-2 - DEO D412-664-145-D-2 - DSI 9563 Rev. B
- DEO D212-664-241-D-2 - D2893 Rev. C
- DEO D212-664-147-B-1 - D2940 Rev. C
- DEO D212-664-247-B-1

PARTS MUST COMPLY ☒ **PREVIOUS PARTS SATISFACTORY** ☐

#	Quality Assurance Actions	Reqd	Resp	Notes	Complete
1	Notify Previous Customers	N			
2	Notify Eurocopter France	N			
3					

#	Engineering Actions	Reqd	Resp	Notes	Complete
4	Required Documents/Drawings Under Review	Y			
5	Update Master Document List (MDL)	Y	KJ	new format <i>Rev. N</i>	<i>11.07.22</i>
6	Update Product Compatibility Matrix	N			
7	Create Eurocopter Form (FEE)	N			
8	Notify TC / FAA of Change	N			
9					

#	Document Control Actions	Reqd	Resp	Notes	Complete
10	Move Electronic Files/Design Journal	Y	KJ		<i>11.07.22</i>
11	Update Product Specification Files	Y	KJ		<i>11.07.22</i>
12	Update Approved/Preliminary Dwg PDF Files	Y	KJ		<i>11.07.22</i>
13	Update Document Record (DR)	N			
14	Update Product Development Summary	N			
15	Update QSI 021 and/or STC Approval List	N			
16	Update Parts / STC Database	N			
17	Update / Verify ARC Database	N			
18	Create / Update Change Record Form / Item Card Database	Y	KJ		<i>11.07.22</i>
19	Create / Update PPP's	Y	KJ		<i>11.07.22</i>
20	Red Decals required?	Y	KJ		<i>11.07.22</i>
21	Update Document Control Database / Laminated Dwgs	N			
22	Update Grey Project / Electronic Binder PDF Files	Y	KJ		<i>11.07.22</i>
23	Update D-Part/M-Drawing/DSI/DEO Master Binders	Y	KJ		<i>11.07.22</i>
24					

Description / Action:

- supports of affected tubes now installed with 3M 2216 & Proseal 890
- D2893-1 & D2940-1: finish removed, 3M 2216 now applied to bottom surface
- D212-664-101 @ CHG 005, D212-664-101B @ CHG 005, D412-664-105 @ CHG 002, D212-664-107 @ CHG 002, D212-664-107B @ CHG 002, D212-664-201 @ CHG 005, D212-664-201B @ CHG 005, D212-664-207 @ CHG 002, D212-664-207B @ CHG 002
- Note that some of the change numbers for the "-xxxB" tubes have skipped a few change numbers. This was to make them the same # as the "-xxx" tubes
- All affected tubes in production need to be made to this latest procedure and chg #.
- Existing crossube stock is OK and doesn't need to be reworked.
- stock D2893-1 & D2940-1 Supports need to be reworked to remove finish & 3M 2216 added, per D2893 Rev. D & D2940 Rev. C
- Add DSI to all paperwork of all affected in-progress crossubes & all affected stock crossubes

ECN Verified & Complete: *[Signature]*

Date: *11/08/24*

ENGINEERING CHANGE NOTICE **DART AEROSPACE LTD**

Date: 11.04.19	Job No.: ENG2107	ADR Yes/No: Y	ADR Date: 11.04.05	ECN #: 11- 549
Product No.: D212-664-101/-201		Created By: [Signature]	Approved By: [Signature]	
Product Name: CROSSTUBE, HIGH		Checked By: [Signature]	General Manager Approval:	

Distribution	Reqd	Resp	Initial / Date
Production Manager / Coord.	Y	LL/MF	h 11.04.19
Purchasing Coord.	N		
Production Engineering Coord.	Y	EC/DD	PA 11.04.19

Distribution	Reqd	Resp	Initial / Date
DQA / QA Coord.	Y	SS	h 11.04.19
QC Coordinator	Y	ED	h 11.04.19
Customer Technical Support	Y	DS	h 11.04.19
Marketing	Y	SW	h 11.04.19
Customer Order Processing	N		

Reason for Change:

DEO'S REQUIRED TO INCORPORATE INSPECTION WINDOW TO FINISHING AS PER NCR11-501.

Documents Affected:

Release DEO D212-664-141-D-1 and D212-664-241-D-1

PARTS MUST COMPLY



PREVIOUS PARTS SATISFACTORY

#	Quality Assurance Actions	Reqd	Resp	Notes	Complete
1	Notify Previous Customers	N			
2	Notify Eurocopter France	N			
3					

#	Engineering Actions	Reqd	Resp	Notes	Complete
4	Required Documents/Drawings Under Review	N			
5	Update Master Document List (MDL)	Y	MB	MDL-D212-664 Rev. L	11.04.18
6	Update Product Compatibility Matrix	N			
7	Create Eurocopter Form (FEE)	N			
8	Notify TC / FAA of Change	N			
9					

#	Document Control Actions	Reqd	Resp	Notes	Complete
10	Move Electronic Files/Design Journal	Y	KJ		11.04.19
11	Update Product Specification Files	N			
12	Update Approved/Preliminary Dwg PDF Files	Y	KJ		11.04.18
13	Update Document Record (DR)	Y	MB	DR-D212-664 Rev. O	11.04.18
14	Update Product Development Summary	N			
15	Update QSI 021 and/or STC Approval List	N			
16	Update Parts / STC Database	N			
17	Update / Verify ARC Database	N			
18	Create / Update Change Record Form / Item Card Database	Y	KJ	D212-664-101/-201 NOW @ CHG004. See Below	11.04.19
19	Create / Update PPP's	Y	KJ	AS REQUIRED.	11.04.19
20	Red Decals required?	Y	KJ	AS REQUIRED.	11.04.19
21	Update Document Control Database / Laminated Dwgs	N			
22	Update Grey Project / Electronic Binder PDF Files	Y	KJ	WITH DR/MDL	11.04.19
23	Update D-Part/M-Drawing/DSVDEO Master Binders	Y	KJ	AS REQUIRED.	11.04.18
24					

Description / Action:

REWORK FINISH OF CROSSTUBES IN STOCK PER RELEASED DRAWINGS.

D212-664-101B/-201B @ CHG002

ECN Verified & Complete: [Signature]

Date: 11/04/19

84557

Description CROSSSTUBE INSITUATION (204/205/212 HAGA APT)

Page 1 of 1

Chc.	Date	Sr	Relevant Documents
001	01.02.20	DS	DE-D212-664 Rev. B
002	05.09.18	dy	MDL-D212-664 Rev.A (OEM COMPATIBLE)
003	07.04.19	CP	MIL-D212-664 Rev.D (MAGNABRAND CLAMPS)
004	11.04.18	dy	DED-D212-664-241-D-1 (ECN 11-51A)
005	11.07.28	dy	DS19563 Rev.B, DED-D212-664-241-D-2 (ECN 11-614)

Intervention - Government Change Report A

302

31659

Date: Tuesday, 03/06/2008 9:50:46 AM
 User: Julie Lecocq

Process Sheet

Customer	: CU-DAR001 Dart Helicopters Services	Drawing Name	: 212/205 HIGH AFT X-TUBE ASSEMBLY
Job Number	: 39659		
Estimate Number	: 10257		
P.O. Number	:	Part Number	: D212664201
This Issue	: 03/06/2008 S.O. No. :	Drawing Number	: D212-664-241 REV C
Prsht Rev.	: NC	Project Number	: N/A
First Issue	: // Type : CROSSTUBES	Drawing Revision	: C
Previous Run	: 39368	Material	:
Written By	:	Due Date	: 13/06/2008 Qty: 1 Um: Each
Checked & Approved By	: <u>JLD 08.6.02</u>		
Comment	: Est Rev:E 04.02.16 Reformat K/DS Est Rev:F 06-03-29 Remove Comments on Pick List JLM Est Rev:G 07-04-30 As per Rev C JLM Est Rev:H 08-05-22 up date Qty of rubber cushion DD verified by:EC		

Additional Product

Job Number:



Seq. #:	Machine Or Operation:	Description :
---------	-----------------------	---------------

1.0	DC	DOCUMENT CONTROL
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Comment: DOCUMENT CONTROL

Photocopy bluefile and create labels as per PPP D212-664-201CHG003

S 02/06/15 08.6.4 JLD

2.0	PACKAGING 1	PACKAGING RESOURCE #1
-----	-------------	-----------------------



Comment: PACKAGING RESOURCE #1

3.0	D212664201TRN	CROSSTUBE TURNING DETAIL
-----	---------------	--------------------------



Comment: Qty.: 1.0000 Each(s)/Unit Total: 1.0000 Each(s)

CROSSTUBE TURNING DETAIL

batch B39429

EL 8-6-9

4.0	BENDING	BENDING MACHINE - SKIDTUBES
-----	---------	-----------------------------



Comment: BENDING MACHINE

Bend tube as per Dwg D212-664-241 using CNC bender program 212-af and Folio FT007

EL 8-6-9

5.0	QC15	DIMENSIONAL CHECK OF X-TUBES
-----	------	------------------------------



Comment: DIMENSIONAL CHECK OF X-TUBES

06.06.09

Date: Tuesday, 03/06/2008 9:50:46 AM
User: Julie Lecocq

Process Sheet

Customer: CU-DAR001. Dart Helicopters Services

Drawing Name: 212/205 HIGH AFT X-TUBE ASSEMBLY

Job Number: 39659

Part Number: D212664201

Job Number:



Seq. #:

Machine Or Operation:

Description:

6.0

CROSSTUBES

CROSSTUBES RESOURCE 1



Comment: LANDING GEAR RESOURCE 1

For Scribe P/W: B# on the inside of the cuff
1-Drill pilot holes in tube as per Dwg D212-664-241 using drill Jig DT8550 & DT8551.

2-Ream hole to finish size in tube as per Dwg D212-664-241 using drill Jig DT8550 & DT8551. Check dimensions between holes, both sides on both cuffs, to ensure alignment with saddle holes.

3-Deburr & Inspect for surface damage. Repair damage within limits as per Dwg D212-664-241

4-Scribe part # and batch # using vibrating stylus as per Dwg D212-664-241

ANM 8-6-10

7.0

HAND FINISHING1

HAND FINISHING RESOURCE #1



ANM 8-6-11



Comment: HAND FINISHING RESOURCE #1

Chemical Conversion Coat as per QSI 005 4.1 within 24 hours of bending and drilling

8.0

QC3

INSPECT POWDER COAT/CHEMICAL CONVERSION



Comment: INSPECT POWDER COAT/CHEMICAL CONVERSION

08/06/11 @

9.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

08/06/11 @

10.0

OUTSIDE SERV.10

OUTSIDE SERVICES -skids



Comment: Sub-Contracting OUTSIDE SERVICES

Liquid Penetrant Inspection as per QSI 038

Issue P/O: *6573*

LPI as per ASTM 1417 Level 2

Attach copy of NDT results to work order

08/10/16 ①

11.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Inspect for transit damage Ensure copy of NDT results attached to work order.

08/11/16 ①

Date: Tuesday, 03/06/2008 9:50:46 AM
User: Julie Lecocq

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: 212/205 HIGH AFT X-TUBE ASSEMBLY

Job Number: 39659

Part Number: D212664201

Job Number:



Seq. #:

Machine Or Operation:

Description :

12.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: DIMENSIONAL CHECK

Inspect for damage & ensure results are as per Dwg D212-664-241

ml 08 06 17

(1)

13.0

SPRAY PAINTING

SPRAY PAINTING



Comment: SPRAY PAINTING

1-Prime inside and outside crosstube as per QSI 005 4.2

2-Paint outside crosstube with White Imron as per QSI 005 4.2

ml 08 06 17

(1)

14.0

QC14

INSPECT SPRAY PAINT



Comment: Inspect Spray Paint

Then, Wrap in plastic bag to protect from scratches

ET 08-06-18

15.0

D29401

Support



Comment: Qty.: 2.0000 Each(s)/Unit Total: 2.0000 Each(s)

Pick:

Qty Part number Description Batch

2 D2940-1

Support

35478

ml 08 06 18

16.0

D3595063530

RUBBER CUSHION



Comment: Qty.: 2.0000 Each(s)/Unit Total: 2.0000 Each(s)

Rubber Cushion

Batch:

38865

ml 08 06 18

17.0

MS2192028

Clamp(per MIL-DTL-8783C)



Comment: Qty.: 4.0000 Each(s)/Unit Total: 4.0000 Each(s)

Pick:

Qty Part number Description Batch

4 MS21920-28

Clamp

107205

ml 08 06 18

Date: Tuesday, 03/06/2008 9:50:46 AM
User: Julie Lecocq

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: 212/205 HIGH AFT X-TUBE ASSEMBLY

Job Number: 39659

Part Number: D212664201

Job Number:



Seq. #:

Machine Or Operation:

Description :

18.0

CROSSTUBES

CROSSTUBES RESOURCE 1



Comment: LANDING GEAR RESOURCE 1

1- Lightly scuff the bonded area using a 320 grit sand paper and clean the area with 41058 wash 'n' wipe

2-Install supports with magnobond as per QSI 015 Adhere for for 12 Hrs

A/R 6398 Magnobond Batch: 107621

Expiry Date: 08/2009

Time: 3:00 pm

3-Install clamps as per Dwg D212-664-241. Torque clamps to 80-100 in lb.

ml
08 06 18 ①

ml 08 06 19 ①

19.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

S 08/06/19 ②

20.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Pick Packing Kit

21.0

D34281

Placard



Comment: Qty.: 1.0000 Each(s)/Unit Total: 1.0000 Each(s)

Placard

Batch: 39322

AS 08/06/19 ③

22.0

AN640A

Bolt



Comment: Qty.: 4.0000 Each(s)/Unit Total: 4.0000 Each(s)

Bolt

Batch: M107376

AS 08/06/19 ④

23.0

AN641A

Bolt



Comment: Qty.: 2.0000 Each(s)/Unit Total: 2.0000 Each(s)

Bolt

Batch: M107013

AS 08/06/19 ⑤

Date: Tuesday, 03/06/2008 9:50:46 AM
User: Julie Lecocq

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: 212/205 HIGH AFT X-TUBE ASSEMBLY

Job Number: 39659

Part Number: D212664201

Job Number:



Seq. #:

Machine Or Operation:

Description :

24.0

AN950JD516

Washer



Comment: Qty.: 18.0000 Each(s)/Unit Total: 18.0000 Each(s)

Washer

Batch:

M107242

JS 08/06/19 (K)

25.0

MS21042L5

Nut



Comment: Qty.: 6.0000 Each(s)/Unit Total: 6.0000 Each(s)

Nut

Batch:

M105077

JS 08/06/19 (K)

26.0

QC4

INSPECT 100% KITS FOR COMPLETENESS



Comment: INSPECT 100% KITS FOR COMPLETENESS

JS 08/06/19 (K)

27.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: HAND FINISHING RESOURCE #1

Identify and pack for shipping as per PPP D212-664-201

Rev-D JS 08/06/19 (K)

28.0

QC21

FINAL INSPECTION/W/O RELEASE



Comment: FINAL INSPECTION/W/O RELEASE

08/06/23/2

Job Completion



MF 08-06-20

Chris Provencal

From: David Shepherd <dshepherd@dartaero.com>
Sent: Monday, July 16, 2012 6:26 PM
To: 'Mike Petsche'; 'Chris Provencal'
Cc: Bill Beckett; Pat Smith; 'Linda Lacelle'
Subject: RE: NCR D212-664-201 & D350-748-201

Chris,

Looking at the photos, I think we should scrap both tubes.

David

From: Mike Petsche [<mailto:mpetsche@dartaero.com>]
Sent: July-16-12 1:59 PM
To: 'Chris Provencal'; 'David Shepherd'
Subject: RE: NCR D212-664-201 & D350-748-201

Honestly, they both look pretty sketchy. The wrinkles are pretty obvious

From: Chris Provencal [<mailto:cprovencal@dartaero.com>]
Sent: Monday, July 16, 2012 3:12 PM
To: David Shepherd
Cc: Mike Petsche
Subject: NCR D212-664-201 & D350-748-201

David, -too NCRs:

D212-664-201

Two dings along the neutral axis; each near one of the supports. -They are up to 0.010" deep . The dents are from shipping damage. Because the damage is from an unknown impact, I am inclined to scrap the tube.

REF. picture [_IM_2848.jpg](#)

D350-748-201

There is rippling on one bend. We used to get this all the time and have shipped out tubes with some rippling before. The tube is actually crushed less than normal, and is well within dwg tolerance, but the rippling makes it more noticeable.

I've been told to try to save every 350 I can, and I think this one is in line with what we would have accepted in the past. After paint, it's clear that you can see it visually as well as to touch. To me, this is more of a customer perception issue.

REF. picture [_IM_2849.jpg](#)

NCR: Yes / No

WORK ORDER NON-CONFORMANCE / UPDATE

DQA dot Date: 13/08/22QA Closed: OK Date: 13/8/19

Work Order: <u>84557</u>				DISPOSITION		AGAINST DEPARTMENT/PROCESS							
Part No. <u>D212-1004-201</u>				Rework <input type="checkbox"/>		Skid-tube <input type="checkbox"/>		Crosstube <input type="checkbox"/>		Water Jet <input type="checkbox"/>		Engineering <input type="checkbox"/>	
NCR No. <u>B-2956</u>				Scrap <input checked="" type="checkbox"/>		Machining <input type="checkbox"/>		Small Fab <input type="checkbox"/>		Prod. Eng. Coord. <input type="checkbox"/>		Quality <input type="checkbox"/>	
				Use-as-is <input type="checkbox"/>		Thermoforming <input type="checkbox"/>		Finishing <input type="checkbox"/>		Rec/Store/Packaging <input type="checkbox"/>		Other <input checked="" type="checkbox"/>	
				Work Order Update <input type="checkbox"/>		Large Fab <input type="checkbox"/>		Composite <input type="checkbox"/>		Supplier <input type="checkbox"/>			

Root Cause	Date	Step	Qty	Description of work order update or Non-conformance	Initial Chief Eng	Action Description	Sign & Date	Verification	QC Inspector
Doc/Data	<u>12/7/17</u>		<u>1</u>	<u>Two nicks in tube from shipping. Located near supports, up to 0.010" deep</u>	<u>UP</u> <u>12/7/17</u>	<u>SCRAP TUBES BASED ON D.S. EMAIL</u> <u>Quinto</u> <u>3319.89</u>	<u>M/M</u> <u>12/7/17</u>	<u>DAS 16 9-89</u> <u>13/08/14</u>	<u>DAS 16</u> <u>13/08/14</u>
Equip/Tooling									
Operator									
Material									
Setup									
Other									
Process									
Supplier									
Training									
Unapproved									

FAULT CATEGORY			
Landing Gear		General	
<input type="checkbox"/> Bending	<input type="checkbox"/> Bend	<input type="checkbox"/> Grain	<input type="checkbox"/> Ovalized
<input type="checkbox"/> Centre Not Concentric to O/S	<input type="checkbox"/> BOM/Route	<input type="checkbox"/> Hardware	<input type="checkbox"/> Over/Under tolerance
<input type="checkbox"/> Cracks	<input type="checkbox"/> Broken/Damaged	<input type="checkbox"/> Inspection Incomplete	<input type="checkbox"/> Part Incorrect
<input type="checkbox"/> Crushed/Crimped	<input type="checkbox"/> Burrs	<input type="checkbox"/> Instructions Incomplete/Unclear	<input type="checkbox"/> Part Lost/Missing
<input type="checkbox"/> Cuffs	<input type="checkbox"/> Contamination	<input type="checkbox"/> Maintenance	<input type="checkbox"/> Part Moved
<input type="checkbox"/> Heat Treat	<input type="checkbox"/> Countersink	<input type="checkbox"/> Mislabeled	<input type="checkbox"/> Positioned Wrong
<input type="checkbox"/> Inspection Strip in Tube	<input type="checkbox"/> Cut Too Short	<input type="checkbox"/> Misread	<input type="checkbox"/> Power Loss/Surge
<input type="checkbox"/> Ripples in Bend	<input type="checkbox"/> Drill Holes	<input type="checkbox"/> Offset	<input type="checkbox"/> Pressure/Forced
<input type="checkbox"/> Torque Waves in Extrusion	<input type="checkbox"/> Drawing	<input type="checkbox"/> Out of Calibration	<input type="checkbox"/> Temperature/Cure
<input type="checkbox"/> Turning Sequence	<input type="checkbox"/> Finish	<input type="checkbox"/> Out of Sequence	<input type="checkbox"/> Weld
<input type="checkbox"/> Wave/Twist in Tube	<input type="checkbox"/> Folio	<input type="checkbox"/> Outside Dimensions	<input type="checkbox"/> Wrong Stock Pulled
		<input type="checkbox"/> Other	

